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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LAVIN, CHRISTOPHER L

ART UNIT PAPER NUMBER

2621

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/676,613	Applicant(s) PHAN ET AL.	
	Examiner Christopher L. Lavin	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. The following quotations of 37 CFR § 1.75(a) is the basis of objection

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

Claims 5, 6, and 9 are objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery. These claims list incorrect claim dependencies. Claim 5 should depend from 2, claim 6 should depend from claim 5, and claim 9 should depend from claim 8. For the purposes of this action the examiner will assume that these corrections have been made.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 – 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peng (5,787,190) in view of Le (5,801,954).

In regards to claim 1, Peng discloses A system that produces a [reticle], comprising: a fabrication device (Figure 1, item 110); and a regulation component that receives [reticle] inspection data from the fabrication device and utilizes the data to facilitate adjusting control parameters of the fabrication device to improve reticle fabrication by mitigating defects associated with delay times (Figure 1, items 154, 150, 152, 156; col. 3, lines 46 – 60).

Peng is focused on wafer design correction. However, the reticle as claimed in the specification and further detailed in later claims the reticle claimed, as one of ordinary skill in the art would know, is created in the same fashion as a wafer. However to further this point a second reference Le (Figure 1), has been provided where reticles (masks) are analyzed and the information is sent through a feedback network to update and correct the mask.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use the system disclosed in Peng to analyze a reticle instead of a wafer. As the reticle in this application is created in the same fashion as a wafer it would be obvious to use the same system disclosed by Peng for reticle analysis. Le provides motivation for this change as Le shows that reticles can have errors and by providing a feedback loop the reticle can be improved which will lead to better wafers created from those reticles.

In regards to claim 2, the system of claim 1, further comprising a collection component that receives data sent from the fabrication device (Peng: Figure 1, items 130, 132, 140, 150, 152, 154, and 156).

In regards to claim 3, the system of claim 1, the regulation component employing at least one of an advanced process control system, a statistical process control system, a feedback system, a feed forward system, a proportional-integral-derivative control system and a fuzzy logic control system (Peng: Figure 1: The feedback loop can be see between item 170 and item 110 where corrected pattern information is sent to the fab unit and used to create a wafer.)

In regards to claim 4, The system of claim 1, the fabricating device further fabricating at least one of a semiconductor and a substrate (Peng: col. 1, lines 11 – 14).

In regards to claim 5, the system of claim 2, the collection component employing an algorithm to process received data (Peng: Figure 1, item 140).

In regards to claim 6, the system of claim 5, the algorithm being a data-mining algorithm comprising at least one of: a neural network, evolutionary programming,

memory based reasoning, a decision tree, a genetic algorithm a nonlinear regression and a Bayseian belief network (Peng: Figure 1, item 140).

In regards to claim 7, the system of claim 1, the fabrication device employed to perform at least one of the steps of expose, post-expose back, develop and inspection (Peng: inspection: col. 3, lines 31 – 46)..

6. Claims 8, 10, 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peng as modified by Le in view of Vernon (6,331,711).

In regards to claim 8, Peng (as modified by Le) discloses a reticle-fabricating device however Peng does not disclose using a resist. However it is well known that resists can be used in reticle creation as shown by Vernon (col. 1, lines 15 – 20).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use resist (as taught by Vernon) in the reticle creation disclosed by Peng (as modified by Le). As already shown Peng focuses on wafer creation, it is very well known in the art that wafers are created using resist. As Vernon shows it is also well known to create reticles using resist. Thus by creating reticles with resist the system disclosed by Peng will little change to detect reticle faults.

In regards to claim 10, A system that fabricates a reticle, comprising: an expose component that writes critical dimensions onto the surface of a resist employed in the fabrication of the reticle (col. 3, lines 4 – 8, to fabricate a reticle or wafer using resist technology an exposure step is required); a develop component to process the resist (col. 4, lines 3 – 7); an inspection component to insure the critical dimensions fabricated on the reticle are not outside of desired tolerances (col. 5, lines 7 – 40); a data collection

Art Unit: 2621

component that receives data from the expose component, the post-expose back component, the develop component and the inspection component (Figure 1, items 130, 132, 140, 150, 152, 154, and 156); a data processing component that determines what changes are needed to the system to improve reticle fabrication to fall within desired tolerances (col. 3, lines 46 – 61); and a feedback/feed forward control component to facilitate changes needed as determined by the data processing component (col. 3, lines 46 – 61: It should be noted that in the specification page 6 feedback/feed forward can be read as an or statement. Thus a feedback loop is shown.).

Peng is focused on wafer design correction. However, the reticle as claimed in the specification and further detailed in later claims the reticle claimed, as one of ordinary skill in the art would know, is created in the same fashion as a wafer. However to further this point a second reference Le (Figure 1), has been provided where reticles (masks) are analyzed and the information is sent through a feedback network to update and correct the mask.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use the system disclosed in Peng to analyze a reticle instead of a wafer. As the reticle in this application is created in the same fashion as a wafer it would be obvious to use the same system disclosed by Peng for reticle analysis. Le provides motivation for this change as Le shows that reticles can have errors and by providing a feedback loop the reticle can be improved which will lead to better wafers created from those reticles.

Peng (as modified by Le) discloses a reticle-fabricating device however Peng does not disclose using a resist. However it is well known that resists can be used in reticle creation as shown by Vernon (col. 1, lines 15 – 20).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use resist (as taught by Vernon) in the reticle creation disclosed by Peng (as modified by Le). As already shown Peng focuses on wafer creation, it is very well known in the art that wafers are created using resist. As Vernon shows it is also well known to create reticles using resist. Thus by creating reticles with resist the system disclosed by Peng will little change to detect reticle faults.

In regards to claim 12, the system of claim 10, the inspection component at least one of a scatterometry system, an ellipsometry system, a laser displacement system, an inductive system and a capacitive system (Peng: col. 4, lines 10 – 21: An electrical test like that described in the paragraph would be testing inductance and capacitance.).

In regards to claim 13, the system of claim 10, the feedback/feed forward component is an advanced process control system (Figure 1, item 158: control is performed in a computer system it is advanced. The feedback has already been shown.)

In regards to claim 14, the system of claim 13, the advanced process control system further comprising at least one of run-to-run control and fault detection and classification (Fault detection and classification: Figure 1, item 158 and 160; col. 5, lines 23 – 52).

In regards to claim 15, The system of claim 10, the data processing component is a data-mining algorithm (Peng: Figure 1, item 140).

In regards to claim 11, The system of claim 10 further comprising post-expose back component (Official notice is taken that it is well known in the art that after using a resist a post-expose bake step is often performed. Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to include a post-expose bake step to the system disclosed by Peng. The post-expose bake step prepares the semiconductor to be developed. This is the standard procedure when dealing with resists and has been shown to work well in the real world.)

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peng as modified by Le and Vernon as applied to claim 8 above, and further in view of Bojko.

In regards to claim 9, Peng (as modified by Le and Vernon) discloses a system for fabricating reticles using resist. However the type of resist is not given. The list of resists provided in claim 9 consist primarily of well known resists. A secondary teaching, Bojko (col. 4, lines 30 – 34) discloses many of these resists.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use one of the resists listed in Bojko as the resist called for in Peng (as modified by Le and Vernon). Peng requires some kind of resist and to use a well known resist is the obvious choice. As the characteristics of the resist will already be well known and most likely will be readily available, a well known resist will help keep costs of fabrication down.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L. Lavin whose telephone number is 571-272-7392. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mancuso Joseph can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Lavin



BRIAN WERNER
PRIMARY EXAMINER